

Atmospheric Chemistry Modeling at NCAR

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ACOM/MMM

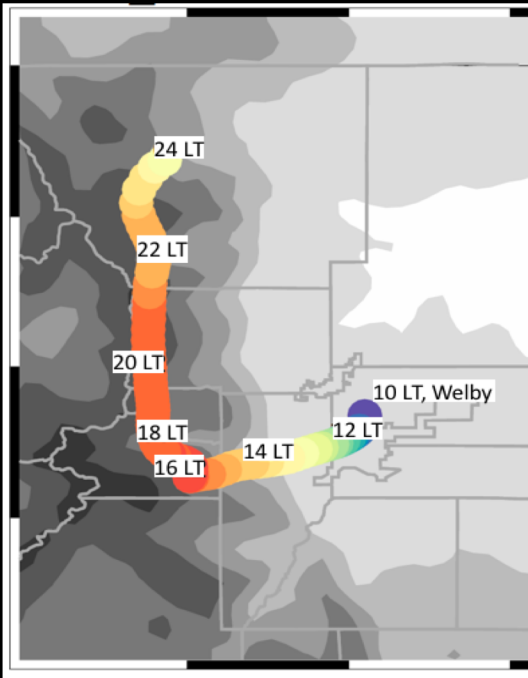
Jean-Francois Lamarque (CGD), Dan Marsh (ACOM/HAO), Andrew
Conley (ACOM)

National Center for Atmospheric Research

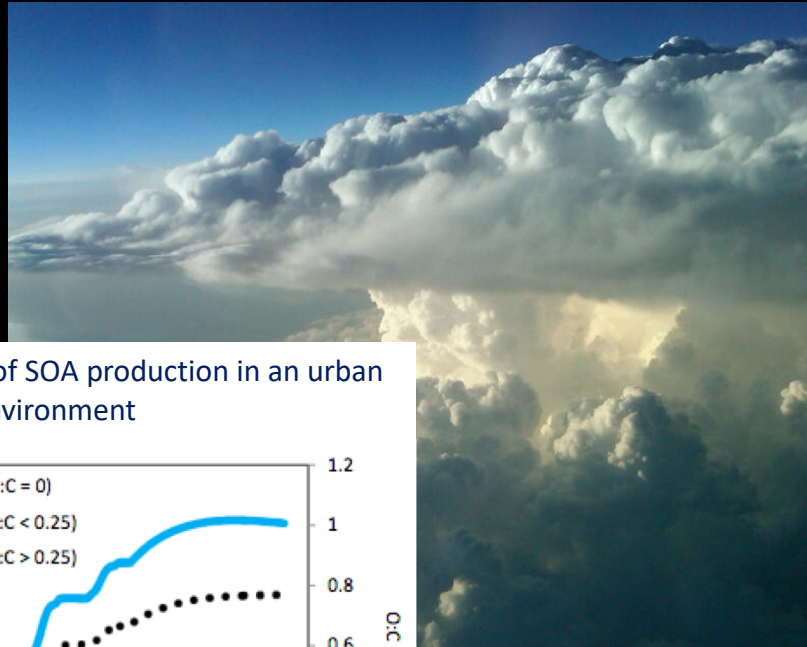
Atmospheric Chemistry Modeling Studies

Chemical Weather

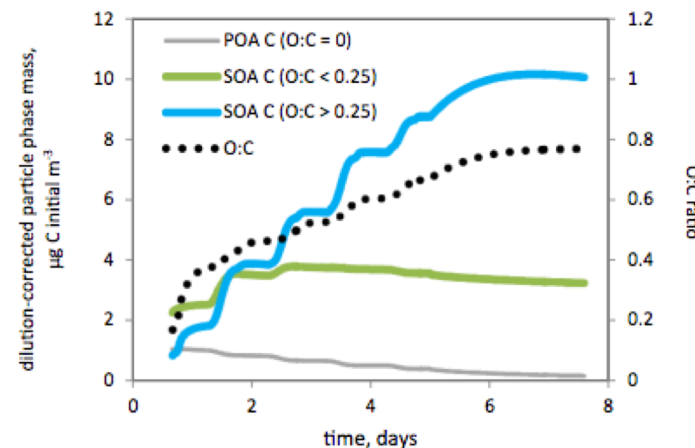
Prediction of ozone along a trajectory from Denver westward into mountains



Understanding Processes Affecting Atmospheric Composition

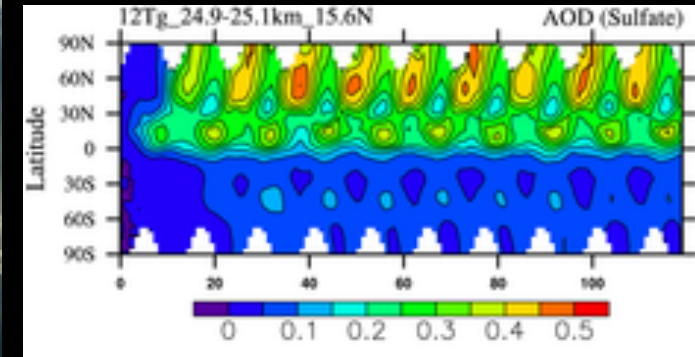


GECKO-A simulation of SOA production in an urban environment



Chemical Climate

Geoengineering: AOD as function of time for SO_2 injection at 15N and 5 km above tropopause

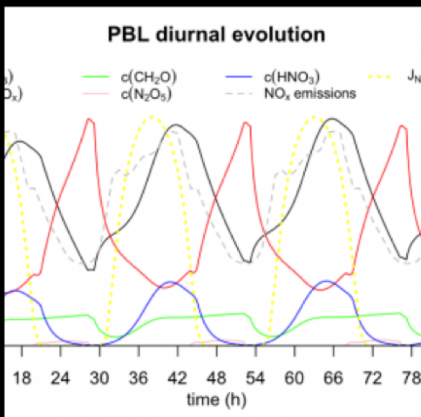


Current Atmospheric Chemistry Modeling at NCAR

Understanding the Chemistry in Detail

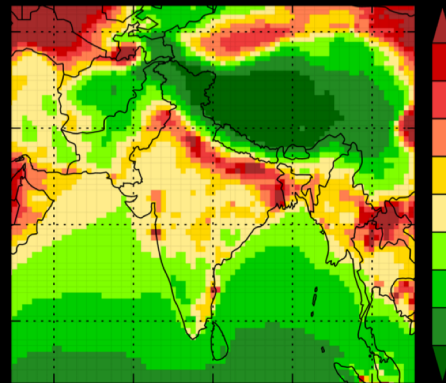
Generator of Explicit Chemistry and Kinetics of Organics in the Atmosphere (GECKO-A)

BOXMOX = box model with chemistry as represented in many 3-d chemistry transport models



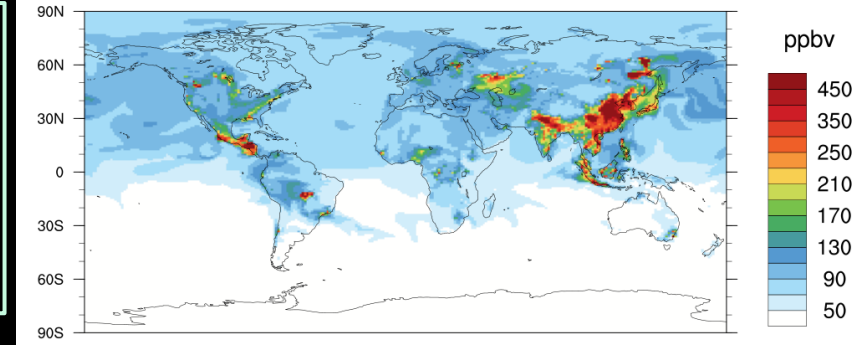
Examining the Urban/Cloud to Regional Scales

Weather Research and Forecasting model coupled with Chemistry



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Surface



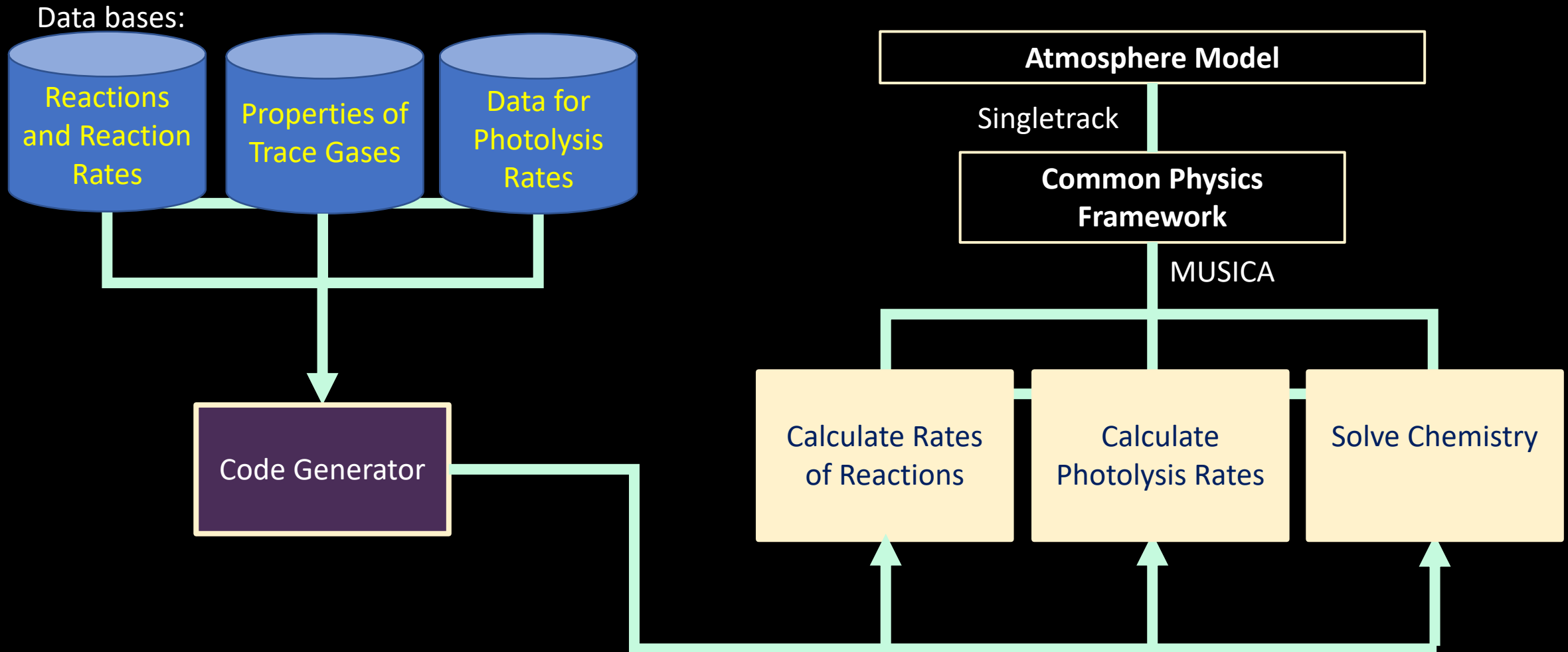
Global Scale Impacts of Atmospheric Chemistry

Community Atmosphere Model with Chemistry

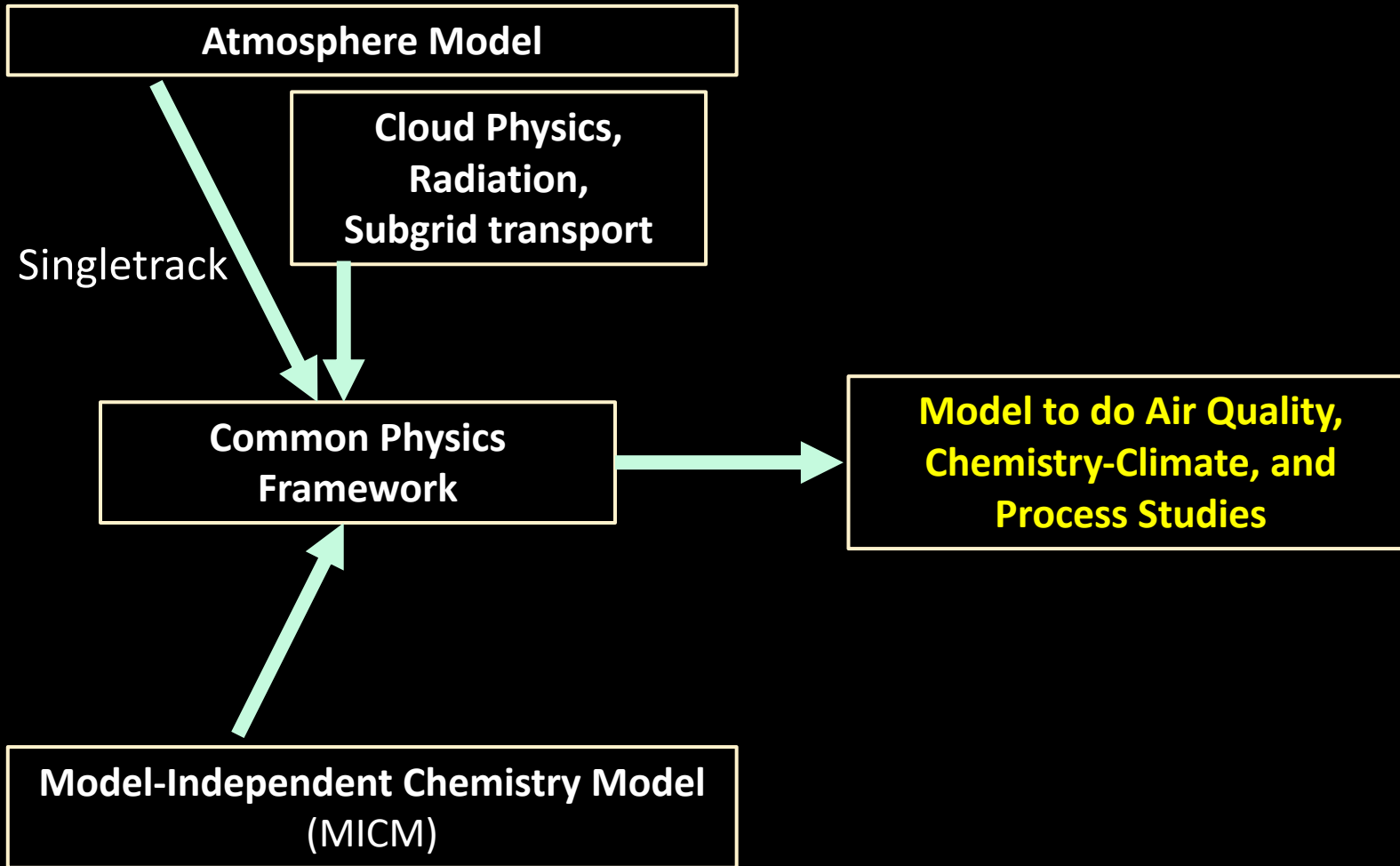
Whole Atmosphere Community Climate Model

Model-Independent Chemistry Module (MICM)

- Same infrastructure for box models, regional-scale models, and global models



Future Atmospheric Chemistry Modeling at NCAR



Ensures physical and transport processes affecting trace gases and aerosols are properly represented in physics routines

- Convective parameterization includes convective transport and wet deposition of trace gases and aerosols
- Cloud physics includes wet deposition of trace gases and aerosols
- PBL parameterization includes vertical mixing of trace gases and aerosols

MUSICA addresses this requirement (to some degree)

Future Global-Scale Atmospheric Chemistry Modeling at NCAR

Multiscale Infrastructure for Chemistry and Aerosols: MUSICA

